

**REMARKS/ARGUMENTS**

Reconsideration of this application is respectfully requested.

The indication of allowable subject matter at claims 10 and 12 is appreciatively noted.

In response to the formality-based objections to the claims (including those based on the second paragraph of 35 U.S.C. §112), the claims have been amended above so as to obviate each stated ground of objection.

Accordingly, all outstanding formal issues are now believed to have been resolved in the applicant's favor.

The rejection of claims 1-7 under 35 U.S.C. §103 as allegedly being made "obvious" based on Dolphin '182 in view of Byham '231 is respectfully traversed.

The presently claimed invention is related to a stack-wide numbering scheme, a special bitmask identifying which units have been visited and which not, and a particular stack configuration. More particularly, this invention concerns the use of control frames separate from the data path and (a) a "self-healing" of the separate control path and (b) control of a switching engine by the control logic that responds to the control messages.

The above amendment to the claims also emphasizes that the control path is separate from the data path for data packets.

This invention represents an important development This invention represents an important development in the configuration and control of cascade systems wherein several units such as switches, bridges or routers are interconnected to form a single controllable entity, such a system being commonly known as a stack. It provides several distinct improvements in the facility for automatically accommodating the insertion of new units in the stack or the failure or removal of one of the units in the stack or the failure of a connecting link. .

When a data packet is received from the external network by a stacked unit, this unit performs a lookup to determine whether the packet is to be merely forwarded out to the network or whether the packet or a copy therefore has to be forwarded form a cascade port to another unit in the stack. The packet may be addressed to a destination reachable only by way of another unit in the stack or it may be that the stack includes a monitoring function such that certain packets are copied to a monitoring unit connected to one or other units in the stack. Stacks may be and preferably are be organised so that there is more than one selectable route within the stack from one unit to another.

The present invention employs special control frames to convey control data from each unit in the stack to the next and vice versa separately from the data path for packets. An important advantage of so doing is the avoidance of the occupation by such control data of the bandwidth available on the cascade data path for packets, especially because the cascade path is usually heavily loaded with packet traffic.

In this respect the claimed system is superior to that shown in Byham because Byham uses the data packets themselves as configuration packets. Dolphin does not (as indeed the Examiner concedes) even discuss the events of link failure or insertion or removal of a unit from a stack and does not (as the Examiner concedes) disclose anything corresponding to the applicant's control messages which are passed between the units.

Byham employs internal multiplexers 106 , 108 and 117 which are controlled by the link status signals that are sent between units *on the main data path* for packets as part of the well-known process known as 'auto-negotiation'. These link status signals have to be in a prescribed format (such as according to IEEE Standard 802.3) and it is either not feasible or undesirable to use them for other purposes. Moreover, they are intended for use only between the ends of a specific link. i.e. they are not passed around the units in a stack.

The present invention employs control messages on a path separate from the path for data packets. In this respect at least it is fundamentally distinct from both Dolphin (who does not describe any control messages passed between the units) and Byham, who has to employ the data path for control. Note that the link status signals in Byham are transmitted and received by way of the same path including the encoders and serializers/deserializers employed for the data packets.

However, the invention goes further. In one aspect it provides loop-back of the control data in the event that there is an absence of control messages on a link. This provides for self-healing of the control path, a function neither contemplated nor possible for Dolphin or Byham.

Second, the present invention allows the switching engine that (normally) determines from the address data in the data packets where any given packet should go to be controlled by the control logic. In particular the computation of a destination can be altered to take into account the operational status of the other units and particularly adjacent units in a stack. A simple practical example of this is described in the specification in the passage from page 35, line 30 to page 36. Not only is the control path healed (as described on page 28 lines 17 to 20) but the operation of the switching engine is modified, in particular by the removal of the relevant unit from the forwarding tables on which the switching engine relies. More complex examples are described as well.

Byham does not describe any switching engine mainly because his described example is that of a hub, which does not need to examine address data to select a destination for a packet but merely forwards a received packet out on all valid ports.

In particular, neither Dolphin or Byham envisage:

1. the use of control frames on a control path *separate from the data path for the data packets*;

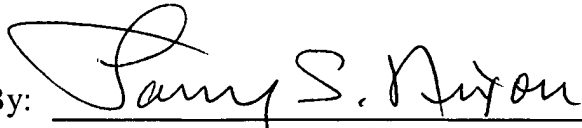
2. the loop-back *of control data* separately from data packets
3. the control by the control logic that responds to the control messages *of a switching engine that (normally) responds to address data in the data packets.*

The rejection of claims 8-9 and 11 under 35 U.S.C. §103 as allegedly being made "obvious" based on Dolphin '182 in view of Byham '231 is also respectfully traversed -- for at least reasons such as those already noted above.

Accordingly, this entire application is now believed to be in allowable condition and a formal Notice to that effect is respectfully solicited.

Respectfully submitted,

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